



Report from the Workshop

"Memorial University - Community Research Partnerships: Resource Management in Marine and Freshwater Environments"

Beaches Heritage Centre, Eastport, NL

22 and 23 August 2008

Report prepared by
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for
The Leslie Harris Centre of Regional Policy and Development
Memorial University of Newfoundland

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Introduction

From 21 to 22 of August 2008, the Leslie Harris Centre of Regional Policy and Development hosted a workshop at Eastport, Newfoundland. The workshop was entitled “Memorial University – Community Research Partnerships: Resource Management in Marine and Freshwater Environments.” Its purpose was to bring together faculty and staff of Memorial University, policy makers, and community members to discuss the issues and opportunities surrounding the Indian Bay watershed and Marine Protected Areas (MPAs) (see Appendix A, Agenda). The workshop featured two research projects supported by the Harris Centre Applied Research Fund, and consisted of presentations and question and answer/discussion periods on research partnerships in Indian Bay and MPAs, an evening presentation from Dr. Art May, and a session of panel discussions led by representatives from governments, unions, and community organizations (see Appendix B, List of Participants).

Workshop participants, stakeholder organizations, and the public more generally speaking will have access to this report. While the workshop itself generated considerable discussion and debate and helped to facilitate the exchange of information about both marine and freshwater fisheries management, it is hoped that this is merely a beginning. That is, the aim of the workshop was in part to begin a discussion, and it is hoped that participants, as well as any other interested parties, will provide comments and feedback both about the meeting that has taken place, about future possibilities for engaging in dialogue about the management of these resources, and the role of university research in informing dialogue and resource management.

Given the diversity of the representatives at the meeting, it is not surprising that the presentations and panels inspired discussion of a wide array of topics and that a plethora of

views, interests, questions, and concerns emerged from the workshop. Generally speaking, however, a myriad of comments, questions, suggestions, and so on revolved around two basic themes – governance and knowledge mobilization. The following report, therefore, is organized around these subjects.

Governance

“Governance” is a concept that has garnered a fair amount of attention in recent years. Of course, the rise in popularity of the term should not lead to the mistaken conclusion that it represents something “new.” Instead, it indicates a recent surge in interest in several long studied, long-recognized aspects of human social and political relations. In essence, what those interested in “governance” want to emphasize is that the ways that human populations regulate their interrelationships with each other and the non-human world involves much more than formal governmental actors and the policies, institutions, and enforcement divisions they create. Instead, it involves those government institutions and actors, as well as complex sets of informal practices, customs, and so forth, that exist in a mutually determining relationship with natural systems.

One of the key messages that emerged from the workshop was that management policies framed as though these informal practices do not exist or do not matter have proven ineffective in providing for the long term viability of the fisheries and coastal communities. A second, related message that emerged repeatedly was that examples like the Eastport MPA and the successes in the Indian Bay watershed demonstrate that fisheries management is possible. That is, they show that one effective strategy for resource management is to build on, to tap into, and

to make central to devising and implementing policy actors from communities in which notions of stewardship have developed out of a population's close proximity to the resources to be managed.

While all agreed that the Eastport MPA represented a positive movement, there was some discussion about the size of MPAs. Some participants noted that extant MPAs were often small and wondered if there were possibilities for developing more biologically meaningful protected areas. That is, even though there was recognition that the results of the Eastport MPA had been impressive, the participant wondered about the possibilities and obstacles for larger protected areas. Others suggested that attempts to close larger areas had been problematic and that, in some cases, for example, in Leading Tickles, the large size of proposed protected areas was inimical to the development of a closed area of any variety. They suggested that a network of smaller MPAs, as opposed to a single, large area, might be more in tune with the desires of people within the communities, and, therefore, might find a greater degree of success.

While most agreed that some form of "bottom up" management was essential to successful management policies, there were also those who argued that there were important challenges to such management strategies. One key difficulty was the long, and by times arduous, nature of the processes involved in creating MPAs. According to workshop participants who had knowledge of, or had been involved with the development of the MPA in Eastport, for example, the process took four to five years and a considerable effort among a handful of dedicated individuals. According to those familiar with Indian Bay, there is no structural support, no constant funding support, and, consequently, a heavy dependence on similarly dedicated individuals. Participants suggested that necessary commitments of time, energy, and resources entailed in establishing and maintaining local management structures unassisted –

especially considering that many of those dedicated individuals are also central to a host of other community services and institutions (the so-called third sector), including the fire department, town councils, etc. – might also deter community members from pursuing such policies.

Moreover, other participants pointed out that while local management strategies were desirable, they were also not necessarily always viable. Community-based approaches, attendees thought, work best where there is a relatively stationary resource on which a particular community has and does depend. In such instances notions of stewardship are most likely to develop and community members are most likely to view themselves as having a stake in ensuring the persistence of resources on which they, their families, and their neighbors depend for a living. The reservations to which some attendees gave voice stemmed from the fact that these sorts of conditions do not obtain universally. Often times, for example, stocks are migratory, or are separated from fixed human populations by hundreds of miles of ocean. In such cases, they suggested, the emergence of notions of stewardship premised on harvesters' close proximity to resources was less likely. Moreover, even if there were some means of encouraging community members to become stewards of resources far removed from themselves, often the management of the resources depends on the negotiation of international agreements.

There was consensus that state actors would obviously be central to any international negotiation. There was also, however, no indication that a reversion to “top down,” government/”expert”-centred approaches to resource management should occur in such areas. Instead, participants suggested that a stakeholder-centred approach might be best. That is, they suggested that an integrated approach which included all stakeholders interested in particular

parts of the ocean should be included in efforts to manage resources within them. While most conceded that some form of integrated management was desirable, the recurrence of the term “stakeholder” led to a discussion of the concept itself. In particular, it led attendees to consider questions of how we go about identifying stakeholders, how do we decide what constitutes a “stake,” and how one might go about getting or losing a stake. This line of discussion tapered off without coming to any final conclusions. One attendee suggested that, based on the Indian Bay experience, it might be best to accept that anyone who thinks they are a stakeholder *is* a stakeholder. While the egalitarian and democratic implications of this definition appealed, some participants raised questions about the potential logistical problems that might result if the number of self-identifying stakeholders were very large.

Knowledge Mobilization

The other major theme that emerged from the workshop was the importance of knowledge mobilization. Like “governance,” knowledge mobilization is a term that has become popular in recent years. In essence, to “mobilize knowledge” is to put available information about a particular subject into active service. Put differently, it is to put available information about a particular topic into the hands of people who would find that information useful either in coming to terms with particular problems, or in accomplishing particular goals and aims.

On numerous occasions conference participants praised the work in both Eastport and Indian Bay, and heralded them as excellent examples of the kinds of positive outcomes possible. They also indicated, however, that there was a need for some means of sharing these examples with other communities, which was imperative for at least two reasons. First, many workshop

participants noted that despite decades of efforts to manage the fisheries in a sustainable way, there are very few success stories. The somewhat gloomy results of the enormous amount of effort that has gone into managing fisheries at sustainable levels, some attendees thought, was itself an obstacle to motivating otherwise willing individuals to take action in their community. Providing such individuals with examples of management efforts that have been successful would themselves help to encourage those interested in community-based management, and might help convince skeptical parties to cooperate with such efforts.

The second reason participants thought that the sharing of these examples was important was that they could serve as guides for others seeking to develop similar initiatives in their localities. Two basic lines of thinking were implied in much discussion about the sharing of information about existing examples as a means of providing a guide to future action. The first related to forms of management like MPAs where there exists a permanent legislative framework by which all parties interested in launching such initiatives must abide. Clearly communities and particular resources vary, and any management structure will be informed by the specificity of the social and ecological contexts involved. Yet, there are also certain basic elements (for example, navigating bureaucratic structures, developing proposals, and so on) common to most such efforts, and participants believed that it is in examining these elements of past examples that present and future groups would have much to gain. The second line of thinking was about examples like the Indian Bay watershed where no permanent legislative framework exists. In such cases, the existing stewardship organization stands as a living testament to what is possible, and a source of valuable information about possible pitfalls and opportunities available to those interested in developing similar systems. It also stands as an important source of information

about the management of freshwater species, as the methods developed through research at Indian Bay (biogeographical and best guess approaches) are transferable to other locales.

Workshop participants also regularly mentioned knowledge mobilization of a different sort. That is, they not only discussed the importance of making information accessible to other parties interested in policy, but also frequently expressed concerns over the seeming tendency for young people to have little familiarity with the resources – freshwater, marine, or otherwise – around them. The apparent disconnect between youth and the natural systems around them troubled participants for a number of reasons. Some thought, for example, that this lack of a connection between them and the environment in which they lived reflected a more general drift toward a more sedentary and less healthy lifestyle. Perhaps of more direct relevance to resource management policy matters was that this distancing might pose a significant challenge to local management in the future. That is, if one of the key components of the foundation for local management regimes are the notions of stewardship which people develop through their close relations with the natural systems on which they depend, a disconnect between youth and resources threatens the future of such efforts.

At one point on the first day, some workshop participants suggested that an appreciation of natural systems might be promoted through school programs. One attendee mentioned that in Clarenville there was a program where school children grew salmon throughout the year and then released them. These programs, however, were not part of the curriculum, but instead owed their existence to particularly enthusiastic educators. The participant wondered if the formalization of such efforts might prove efficacious. On the following day, the topic came up again, and another attendee suggested that whatever the form of the training, what young people needed to be taught most of all was not simply conservation, but the sustainable use of resources.

The participant suggested that notions of stewardship emerged not out of a detached celebration of nature, but out of the use of the resources. It was not simply an appreciation of fish and other wildlife for their own sake, but the actual harvesting of the resources which promoted both an understanding of the natural system, and a strong desire to use it in ways that ensured future harvesting would be possible.

Another key point about knowledge mobilization emerged toward the end of the session. Some participants suggested that in the past making information available about a particular problem or issue was necessary but not sufficient. That is, while in the past fishermen and their organizations had made particular threats to the fisheries known, they found that informing other parties about problems was of little use if there were no commitment to take action to remedy the problem. One participant suggested that this was an excellent illustration of a problem that often faces policy makers. In particular, in the present age of rapid and mass communication, it can be easy to get knowledge to a variety of interested parties. Those communication links (or “weak ties”) are useful for disseminating information, and yet are not necessarily easily translatable into actually getting tasks completed. Put differently, if there is to be an outcome of any significance, knowledge mobilization must be coupled with the mobilization of money and personnel. The question of how we might identify and secure the support of those with control over money and personnel was left for future discussion.

Conclusion

Overall participant evaluations (see Appendix C) suggest that attendees agreed that the workshop demonstrated that community-university partnerships have produced impressive results. Moreover, they also suggested that as concrete instances of community-based management, the

Indian Bay and Eastport examples were both practical guides for others interested in initiating similar efforts, and were a source of inspiration. Yet, participants also suggested that there was much room for expanding such research partnerships. They also believed that all involved parties (government, universities, and community and other organizations) should make the adjustments necessary to further initiatives of this sort, and that future workshops highlighting new developments in this regard ought to be forthcoming.

Appendix A: Agenda



Memorial University – Community Research Partnerships: Resource Management in Marine & Freshwater Environments

Beaches Heritage Centre, Eastport, NL

August 21-22, 2008

Summary: This two-day event will bring together faculty and staff of Memorial University, policy makers and community members to discuss the issues and opportunities surrounding the Indian Bay watershed and Marine Protected Areas (MPAs). The event will be comprised of three sessions: an afternoon session on the 21st that will consist of presentations and Q&A on research partnerships in Indian Bay and MPAs, an evening presentation from Dr. Art May, and a morning session on the 22nd with panel-led discussions with representatives from governments, unions and community organizations.

Agenda Thursday, August 21 Beaches Heritage Centre

- 1:00 pm - Introduction/Roundtable
- 1:30 pm - Presentations on Indian Bay Research Partnerships – Dr. Ian Fleming & Blair Adams (Followed by Q&A)
- 2:30 pm - Break
- 2:45 pm - Presentations on the MPA Research Partnerships – Kate (Jones) Wilke – “Marine Protected Areas in Canada with particular emphasis on Newfoundland: Science, Policy, and Implementation at Multiple Institutional Levels” (Followed by Q&A)
- 3:45 pm - Panel Discussion/Q&A w/ Kelly Vodden (Memorial), Vicki Hammond (MPA Coordinator) & Dr. Robert Otto (Sir Wilfred Grenfell College – Institute for Biodiversity, Ecosystem Science & Sustainability)
- 4:30 pm – Adjourn
- 5:00 pm – Dinner – Rosie’s (Provided by the Harris Centre)

6:45 pm - Return to Heritage Centre

7:00 pm – Dr. Art May – “Are Fisheries Manageable?”

*Spouses and Significant Others Welcome for Dinner and Evening Session
- Please Confirm Attendance

Friday, August 22

9:00 am - Panel Discussion w/ Patrick Shea (DFA), Blair Thorne (DFO) & David Vardy (INTRD) followed by Q&A

10:15 pm - Break

10:30 am - Panel Discussion w/ George Feltham, Patricia Hounsell (Indian Bay Ecosystem Corp.) & Harvey Jarvis (FFAW)

11:30 am - Open Q&A/Wrap-up and Next Steps

12:00 noon - Adjourn

Appendix B: List of Attendees

Art May	Guest Speaker, Memorial
Barb Neis	Sociology, Memorial
Blair Adams	Gov. of NL
Blair Thorne	Department of Fishery and Oceans (DFO), MPA Biologist
Craig Purchase	Biology, Memorial
Dave Vardy	Harris Centre
Dave Vardy	Industry, Trade and Rural Development (INTRD), Gov. of NL
Edythe Goodridge	Rural Secretariat, Gov. of NL
George Feltham	Fish, Food and Allied Workers (FFAW)
Harvey Jarvis	Fish, Food and Allied Workers (FFAW)
Ian Fleming	Biology, Memorial
Ian Ivany	Biology, Memorial
John Duff	Harris Centre
Kate Reid-Shute	Harris Centre
Kate Wilke	Ocean Sciences Centre (OSC), Memorial
Kelly Vodden	Geography, Memorial
Kurt Korneski	Harris Centre
Patricia Housell	Indian Bay Corporation
Patrick Shea	Department of Fisheries and Aquaculture (DFA), Gov. of NL
Peter Sinclair	Sociology, Memorial
Rob Greenwood	Harris Centre
Sheila Boutilier	Industry, Trade and Rural Development (INTRD), Gov. of NL
Sheldon Eddison	Fisheries Officer, Department of Fishery and Oceans (DFO)
Steve Moss	EDO, Kittiwake Economic Development Corporation (KEDC)
Tanya Noble	Rural Secretariat, Gov. of NL
Teresa Green	Exploits Valley EDC
Terry Simms	Save our Char Committee
Vicki Hammond	Newfoundland and Labrador Marine Protected Areas (NFMPAs)
Wade Turner	Eastport MPA

Appendix C: Summary of Participant Feedback



*Memorial University – Community Research Partnerships:
Resource Management in Marine & Freshwater*

August 21/22, 2008 – Eastport, NL

Highlights from evaluation questionnaires

Prepared by: Kate Reid-Shute

Harris Centre brought together a diverse group of researchers (from and community stakeholders (including people from all levels of government, economic development corporations, unions, local resource management organizations and other community organizations). Two ARF papers, *Marine Protected Areas: Policy Context and Science Basis in NL* (Schneider et al) and *Building the Road to Proactive and Scientifically Sound Management of Exploited Fish Populations in NL in the Context of Regional Development* (Fleming et al), were presented by researchers (Kate (Jones) Wilke and Ian Fleming, respectively) along with other presentations and panel discussions. The research was presented in accessible language (i.e. free of academic language or, where such language was used, plain language explanations were also offered) and real-life implications of the research were made clear.

There much two-way communication between participants, with all present contributing knowledge and perspectives. Of seventeen evaluation respondents, all respondents agreed (twelve strongly agreed) that there was sufficient opportunities for discussion between researchers and community stakeholders about the needs of the community. The workshop report will be sent to all participants, furthering the discussion and knowledge transfer.

Memorial's community presence was increased through the workshop. Twelve respondents agreed (two strongly agreed) that the event increased their understanding of how Memorial research can be useful in assisting community stakeholders in regional policy and development, and ten respondents agreed (two strongly agreed) that as a result of attending the event they would be more likely to draw upon Memorial research and researchers in the future for assistance with regional policy and development issues.

Some participant feedback on how they expect to apply the knowledge gained through the workshops is below:

Comments on increased expertise gained through the event:

- “The research can be used as a valuable tool for conservation initiatives. The models developed can be used by other organizations in the assessment of species/ecosystem decline.”
- “As a committee just starting to get involved this gives me some insight into stewardship and MAs – listening to some of the problems encounters as well as benefits from having areas designated as MPAs.”
- “Use the information as evidence that ‘bottom up’ is more likely to result in success than ‘top down’.”
- “Tools used are relevant: bottom up, community leadership, local/traditional knowledge”
- “Help local stewardship group move forward”

Comments on plans for future collaborations with researchers:

- “I also will learn more about community relations from Kelly, Blair et al in future private communications.”

Comments on plans for future dissemination of findings:

- “Share the information – future contacts for community org[anization]s in similar thinking”
- “I will use the Indian Bay example as a talking point in visits to schools & lobbying local government.”

Question	Score (Out of 5)
A. The topic selected is appropriate and relevant	4.39
B. Level of interest in the topic	4.39
C. The main speaker was well informed and provided relevant information	
i. Ian Fleming (Indian Bay Presentation)	4.39
ii. Kate Jones (MPAs Presentation)	4.41
iii. Art May	3.39
D. The presentation was delivered in a clear and concise manner	
i. Ian Fleming (Indian Bay Presentation)	4.33
ii. Kate Jones (MPAs Presentation)	4.41
iii. Art May	3.87
E. The panelists were well informed and provided relevant information	4.28
F. There were sufficient opportunities for discussion between researchers and community stakeholders about the needs of the community.	4.44
G. The forum allowed sufficient time for Q & A	4.00
H. The workshop has given me a better understanding of the issues involved.	4.17
I. This event has increased my understanding of how Memorial research can be useful in assisting community stakeholders in regional policy and development.	3.56
J. As a result of attending this event, I will be more likely to draw upon Memorial research and researchers in the future for assistance with regional policy and development issues.	3.75

Appendix D: Presentation, Ian Fleming

Appendix E: Presentation, Blair Adams

**Life History-Based Population Models:
Predicting population responses to
exploitation in recreational fisheries**

Dr. Blair Adams
Parks Canada, Memorial University and the Indian Bay
Biological Station





Indian Bay Biological Station

- Community based conservation and stewardship
- Developed from a garbage clean up in 1988
- Solved many of the local conservation issues
- Attempting to create a knowledge based business in rural Newfoundland



Project Background

- Develop a biologically sound management model
- Ecological Innovations Fund
- Four partners – TNNP, GMNP, FNP and Indian Bay Ecosystem Corporation



Project Objectives

- Develop an alternative monitoring and management method
 - Low resource requirements
 - Robust to variable data
- Current management models are based a maximum/optimal yield approach
 - Ecological integrity is important to national parks
 - Constant intensive monitoring



Regional Management Challenges

- Large numbers of independent populations
 - Life histories of geographically proximate populations may differ substantial
- Resource and logistical constraints
 - Rarely can the required resources be justified
- Choosing and enforcing regulatory regimes
 - Population specific management is generally not enforceable and likely to be rejected by stakeholders

Common Solutions

- Arbitrary/most acceptable “best guess” approach
- Biogeographical approach
 - Defining populations based on easily measurable environmental variation
- Sporadic population specific management
 - Usually focused on troubled populations



An Alternate Approach?

- Does not require continuous, intensive monitoring
- Biologically defensible method of protecting ecological integrity and providing high probabilities of persistence
- Provides protection across a wide range of population variation
- Simple management regime

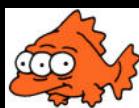
Generalized Life History Model

- Define regional lake specific population types
- Examine responses of population dynamics to exploitation across the range of population types
- Choose best management practice for this range of life history variation or population type



Model Parameters

- Egg-to-age 1 survival, juvenile survival, adult survival
- Pre-maturation growth rate and post-maturation growth rate
- Reproductive effort (fecundity)
- Age at maturity
- Combine these data to estimate intrinsic rate of increase (r)



Applying the Model

- Creating a conditional rate of change surface for each population and for the region based on a survey of local, regional, or species wide life history variation
- Apply alternative management strategies and test the effect on the fitness curve under current and simulated conditions

Project Specifics

- Brook trout
- Four to six lakes per site at four sites over three years
 - Indian Bay, NL
 - Terra Nova National Park, NL
 - Gros Morne National Park, NL
 - Fundy National Park, NB
- Standardized littoral zone trapping program
 - Spring (May-June) and Fall (August-October)

Project Specifics

- Spring sampling
 - Mark-recapture
 - Creel Survey
- Fall sampling
 - Lethal sampling (including fishing simulation)
 - Life history data

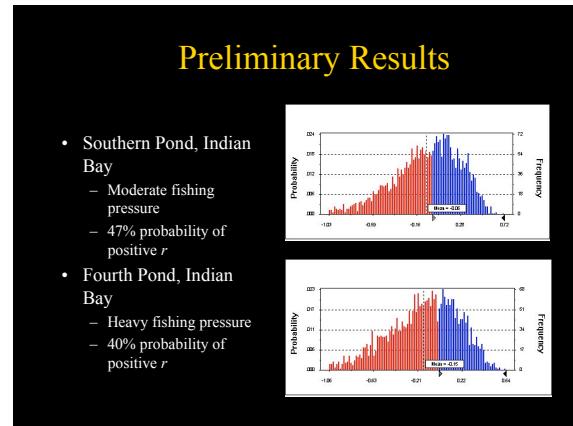
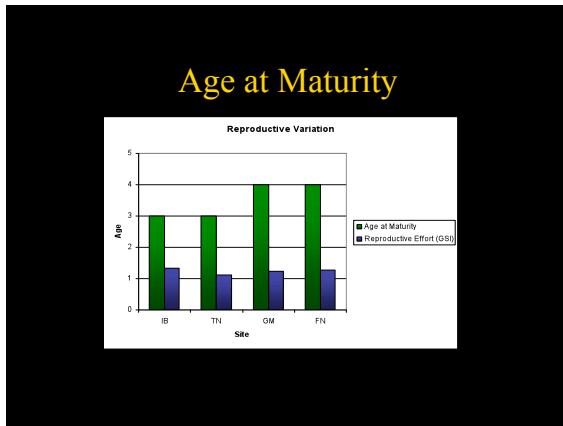
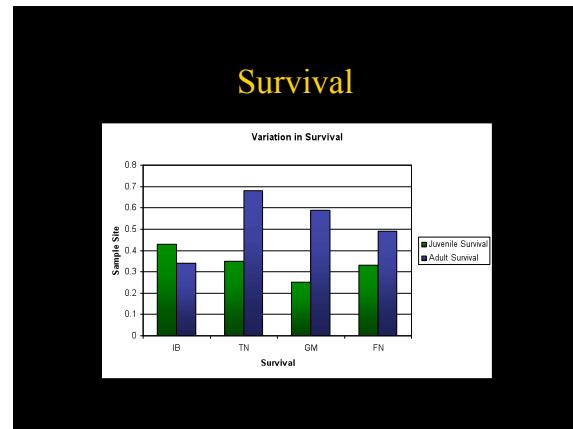
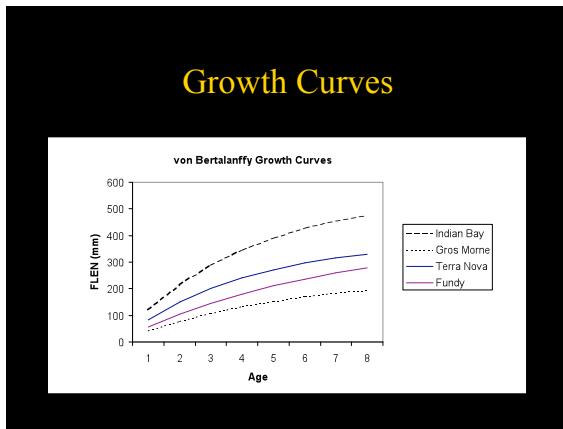


Experimental Manipulations

- Four lake types per site
 - Control lake
 - Control, exploited
 - Simulated exploitation, managed (TNNP,GMNP)
 - Simulated exploitation, unmanaged (TNNP,GMNP)
- Will the populations respond the way we predict?

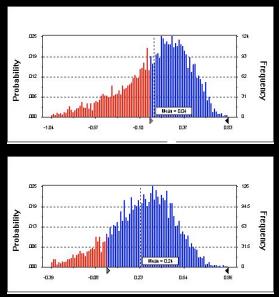
Results

- Life History Variability
 - Growth
 - Survival
 - Age at maturity
 - Reproductive effort
- Estimates of population change
 - Predictions and responses
 - Management Decision Curves



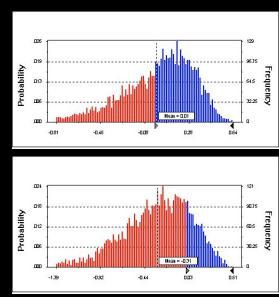
Preliminary Results

- Southern Pond with minimum size of 30 cm
 - 62% probability of positive change
- Fourth Pond with minimum size of 25 cm
 - 84% probability of positive change



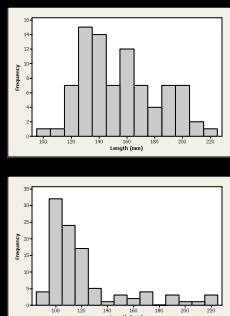
Gros Morne

- Trout Pond, Gros Morne
 - Un-fished, 59% probability of positive change
 - Moderate fishing pressure, 33% probability of positive change



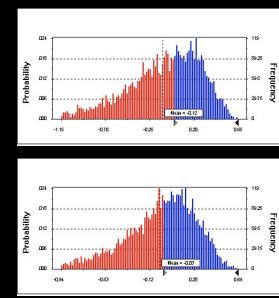
Gros Morne Simulated Exploitation

- Simulated exploitation
 - 15% annual fishing mortality
 - Substantial impact on fish numbers above 150 mm
- Suggests low resilience to exploitation
- Initial population – 2497
- Predicted final – 1861
- Actual final - 1716



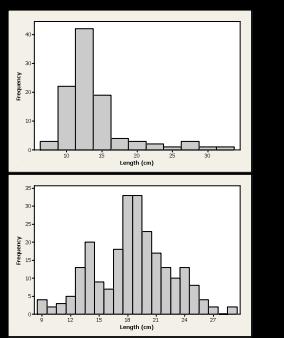
Preliminary Results

- Yudle Pond
 - 22.5 cm minimum size
 - Probability of positive change increased from 44% to 63%

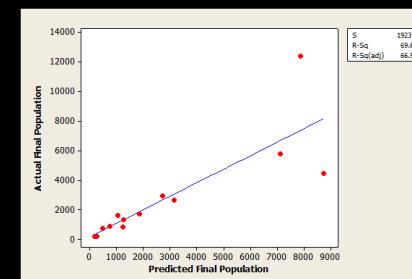


Terra Nova

- Yudle Pond
 - Moderate fishing pressure (25-45% annual mortality, >180 mm)
- 22.5 cm minimum size
- Initial population – 507
- Predicted – 1233
- Actual – 1603
- Equal numbers of fish for anglers but larger size



Predicted Abundances



Broad Management Policy

- Integrate the life history data from the whole range of variation known for the species
- Development of management decision curves
- Placing populations or regions of interest on the decision curve
- For example, 230 mm minimum size provides a 75% chance of positive growth in all populations

Conclusions

- Brook trout life histories can vary substantially even within watersheds.
- We were able to successfully predict population responses to exploitation in 14 of 16 populations
- The preliminary analysis suggests that a minimum retention size is the most effective method to ensure population persistence across a broad range of life history variation

Acknowledgements

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- Dr. Tom Knight
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- Parks Canada
- IBCES
- NSERC
- ACOA
- Harris Foundation



Appendix F: Presentation, Kate Wilke

Marine Protected Areas in Newfoundland and Labrador: Science, Policy, and Implementation at Multiple Institutional Levels

A project funded by the Leslie Harris Centre



Kate Wilke

Dr. David Schneider

Dr. Paul Snelgrove

Marine Protected Area (MPA) collaborative research: 2003-present



Fisheries and Oceans Canada Pêches et Océans Canada



Marine Protected Area (MPA) collaborative research: 2003-present

- DFO Oceans, MUN, and Leading Tickles fishers study capelin, lobster, herring, and conduct habitat mapping in the context of MPAs



Fisheries and Oceans Canada Pêches et Océans Canada



Newfoundland & Labrador, Canada



Marine Protected Areas



Marine Protected Areas

Marine Protected Area (MPA) collaborative research: 2003-present

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- A project exploring MPA policy is funded by the Harris Centre



Fisheries and Oceans Canada Pêches et Océans Canada



Newfoundland & Labrador, Canada



Marine Protected Areas



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- A project exploring MPA policy is funded by the Harris Centre
- On-going MPA-related work in Eastport



Fisheries and Oceans Canada Pêches et Océans Canada



Newfoundland & Labrador, Canada



Marine Protected Areas



Marine Protected Areas

Marine Protected Area (MPA) collaborative research: 2003-present

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Newfoundland & Labrador, Canada



Marine Protected Areas



Marine Protected Areas

HarrisCentre
THE LILIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT

Project: Marine Protected Area Policy

1. Policy framework in Canada
2. Implementation: a case study in Newfoundland
3. Internationally significant science questions

HarrisCentre
THE LILIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT

Project: Marine Protected Area Policy

1. Policy framework in Canada
2. Implementation: a case study in Newfoundland
3. Internationally significant science questions

HarrisCentre
THE LILIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT

Project: Marine Protected Area Policy

1. Policy framework in Canada
2. Implementation: a case study in Newfoundland

Engaging the community...

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THE LILIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT

Project: Marine Protected Area Policy

1. Policy framework in Canada
2. Implementation: a case study in Newfoundland
3. Internationally significant science questions

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THE LILIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT

Project: Marine Protected Area Policy

Need to expand...

➤ What are the major sources and sinks for reproductive propagules?

1. Policy framework in Canada
2. Implementation: a case study in Newfoundland
3. Internationally significant science questions

http://www.photographersdirect.com/news200309/imagesNN_92_15_5.jpg
www.blacksea.orionok.ru/imagesn1.jpg

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Project: Marine Protected Area Policy

Need to expand...

➤ Why do some habitats and geographic areas contribute disproportionately in terms of larval and juvenile survival and abundance?

1. Policy framework in Canada
2. Implementation: a case study in Newfoundland
3. Internationally significant science questions

www.tier-environnement.org/blog
[www.pubs.usgs.gov](http://pubs.usgs.gov)

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Need to expand...

➤ What features of the environments (geology, biology, physics, chemistry) affect that pattern?

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www.lifeintheatlantic.ca/wp-content/uploads/2008/02/giant_sea_creatures_3

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Engaging the community...

- ✓ Maintaining a presence—show up
- ✓ Answer questions
- ✓ ASK questions – listen to answers
- ✓ Community feedback sessions
- ✓ Interviews
- ✓ Be persistent





Acknowledgements

Ariel Parsons, Paul Martin, David Parsons, Enos Martin, Winston Loveman
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Marine protected area: Policy framework in Canada

What is a marine protected area?
 An area in the ocean that has been reserved by law to protect part or all of the enclosed environment.

Ecological Reserves	Provincial Dept. of Environment & Conserv.
Migratory Bird Sanctuaries	Can. Wildlife Service/Environment Canada
National Marine Conservation Areas	Parks Canada
Marine Wildlife Areas	Can. Wildlife Service/Environment Canada
Marine Protect Areas	Department of Fisheries & Oceans

Marine Protected Area (MPA) – is a reserve created under Canada's Oceans Act